

Algorithm

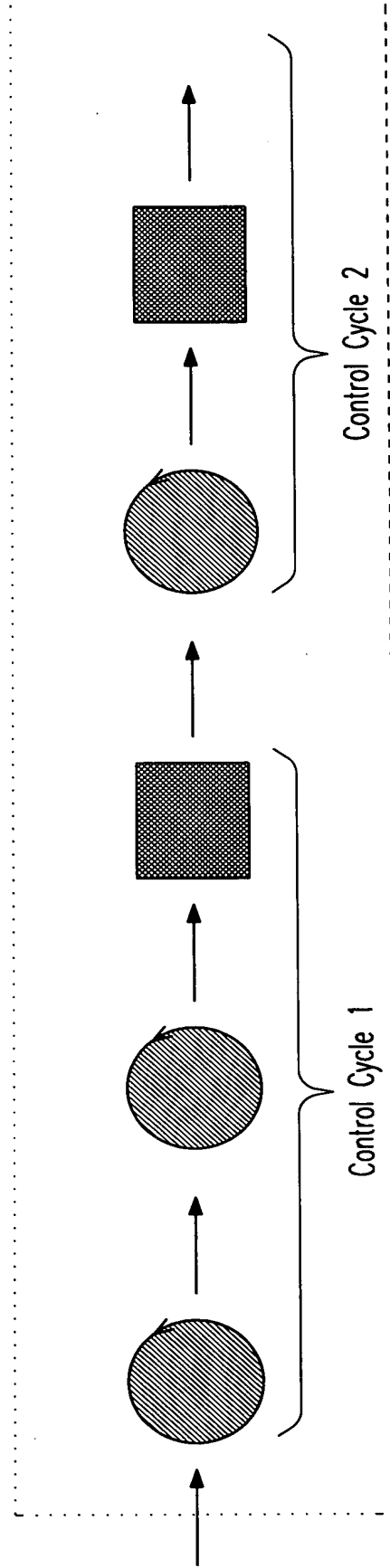
```

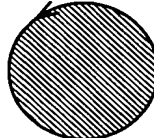
t:=0;
encode and initialize P(0)
decode and evaluate P(0)
do
    recombine P(t)
    mutate P(t)
    decode P(t)
    evaluate P(t)
    P(t+1) = select (P(t))
    encode P(t+1)
    t:=t+1
until terminate
    
```

Fig. 1

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2/6



 Fitness evaluation using the approximate model

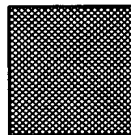
 Fitness evaluation using the original function

Fig. 2

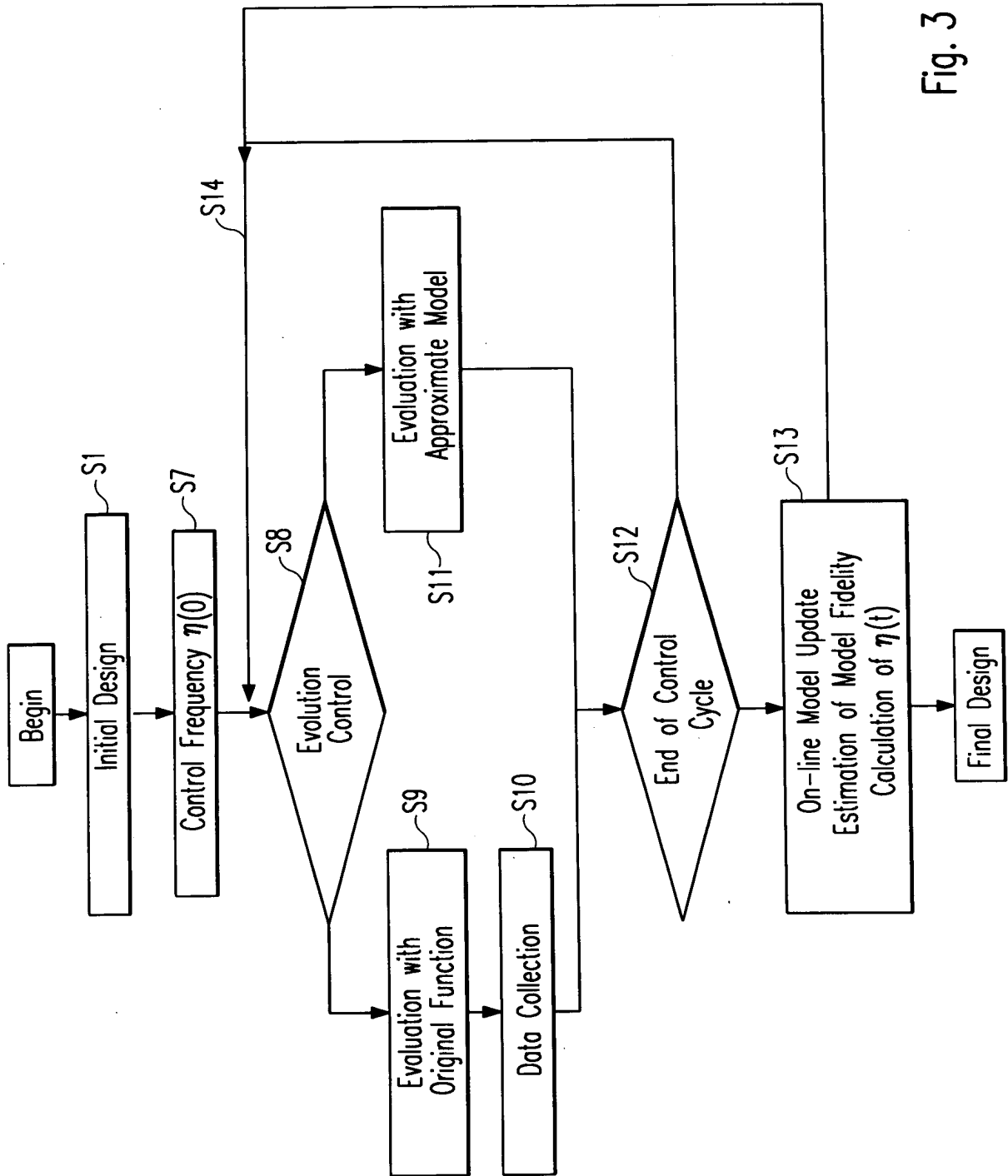


Fig. 3

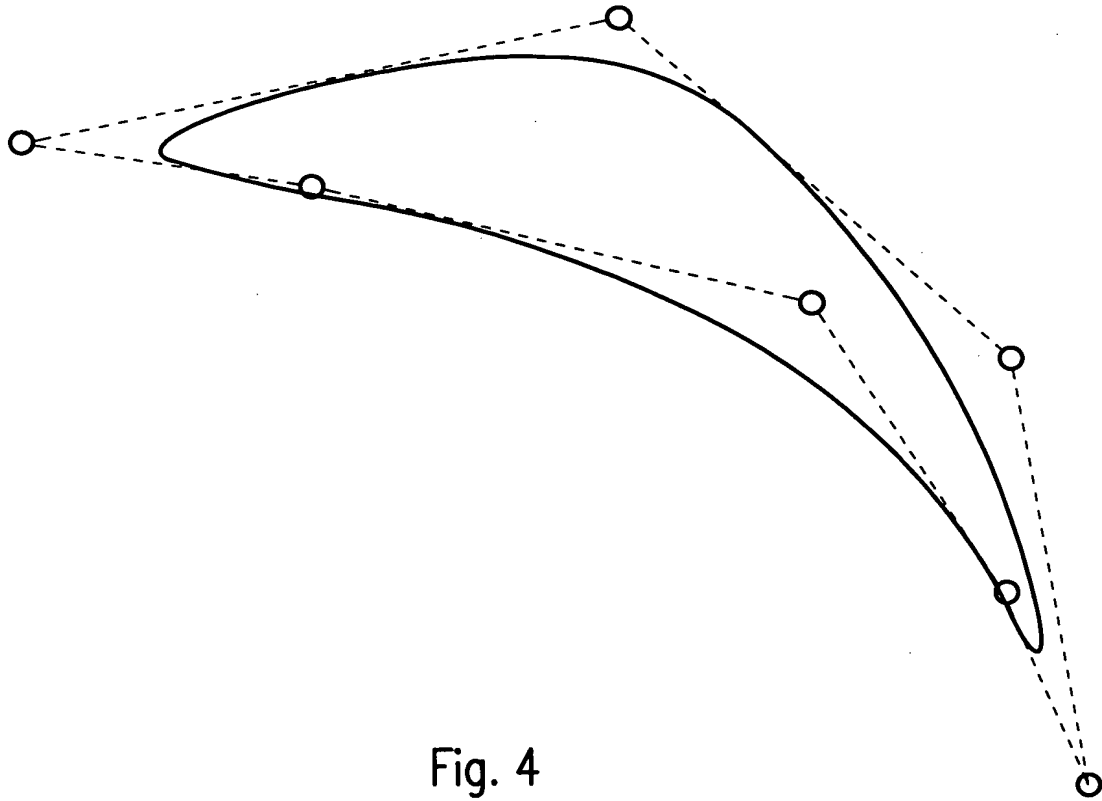


Fig. 4

400724-4004
400724-4004

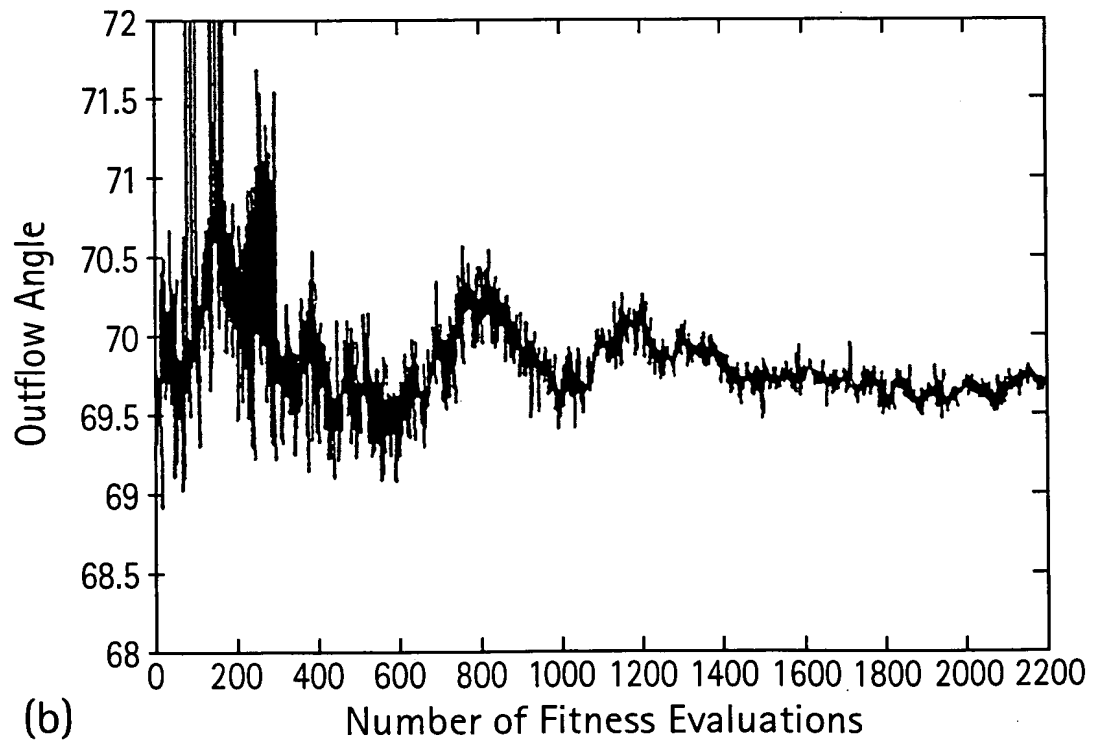
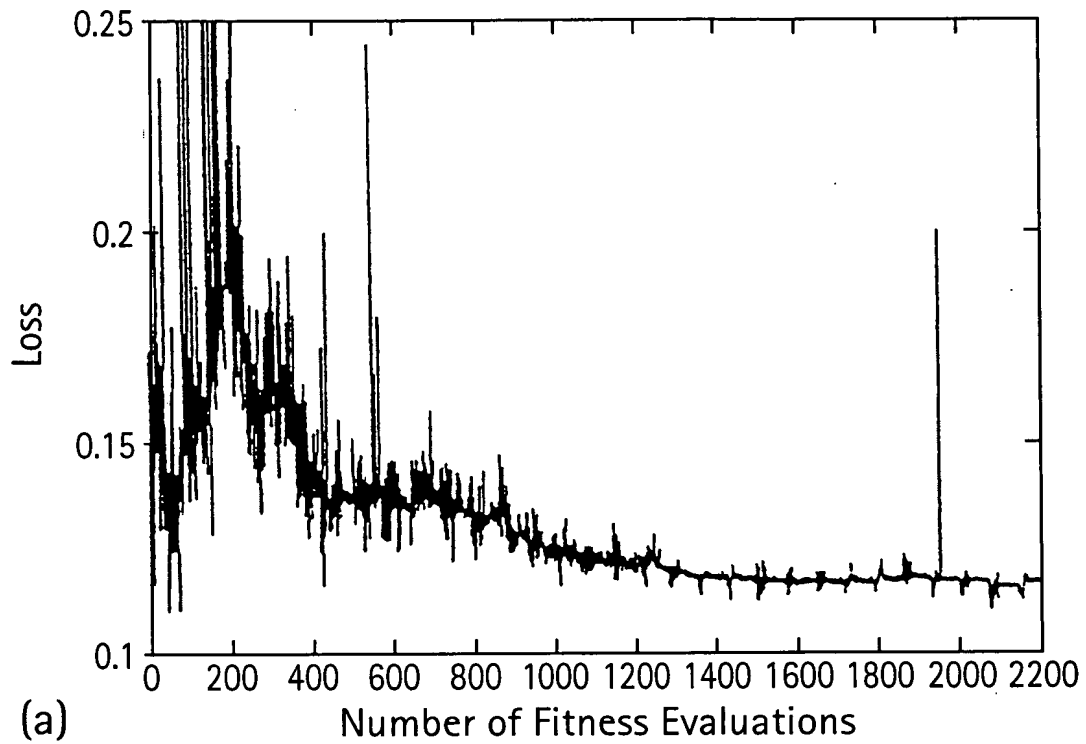
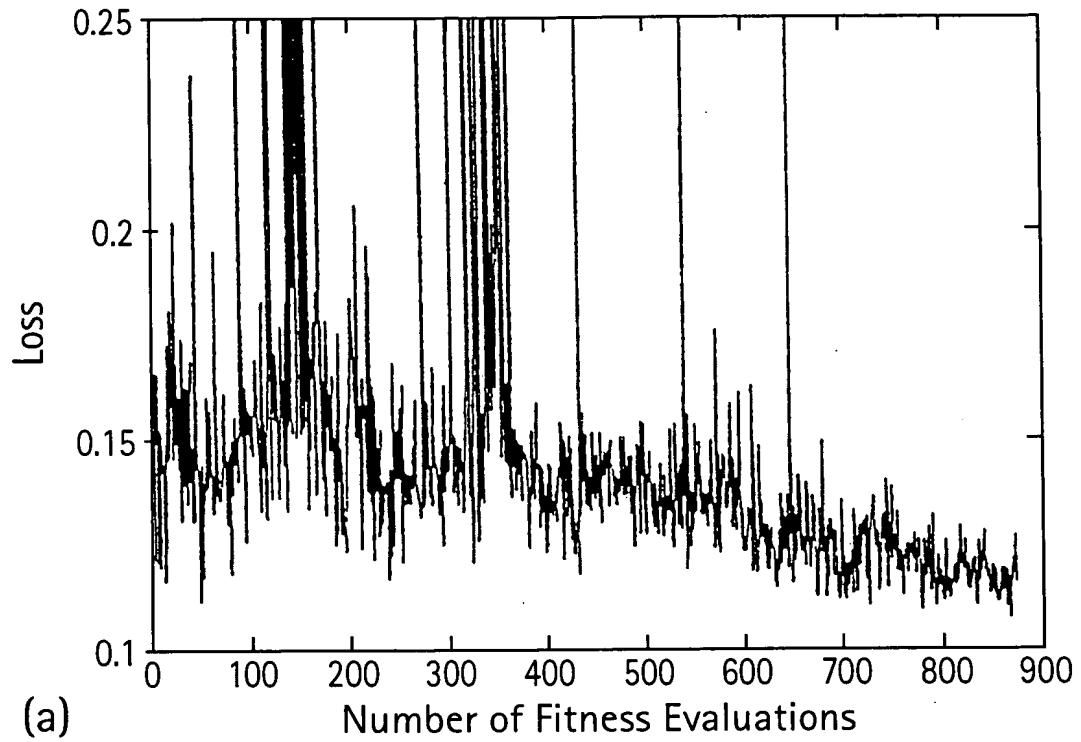
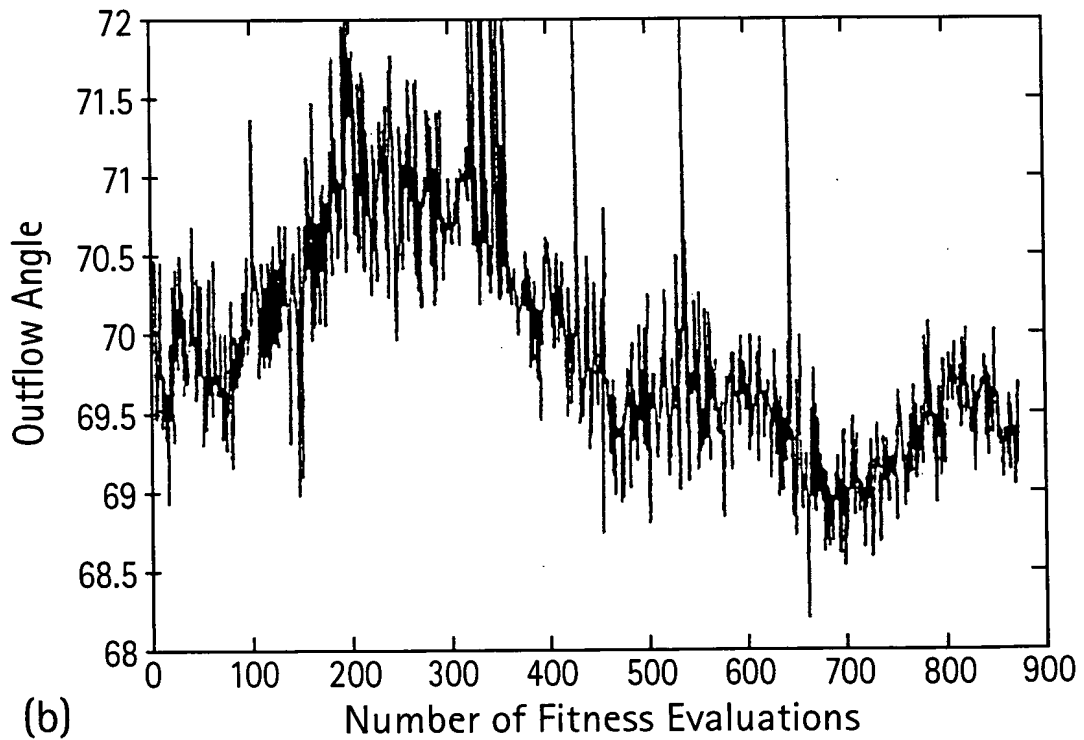


Fig. 5 Blade optimization with approximate models (a) Pressure loss
(b) Outflow angle.

6/6



(a)



(b)

Fig. 6 Blade optimization with approximate models (a) Pressure loss
(b) Outflow angle.